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ABSTRACT

Originally presented at the 1966 Dartmouth Seminar, these two papers address the question, "What use can be made of technological innovations in English classes?" Alfred H. Grommon suggests that technological aids are here to stay. What the teacher should remember is that technological innovations cannot create, but they can transmit a wealth of ideas, procedures, information, and skills to thousands of other students. The teacher, on the other hand, is left free to lead students into a consideration of what is possible, the "why" aspect of man, to lead them to the distinction between convergent and divergent thinking, to a discussion of the nuances of oral and written expression and literature, to an exploration of the open-ended questions and ambiguities in literature, and to lead them to discover for themselves, to speak more effectively, and to communicate with people. Susan Markle comments on the wealth of materials resulting from technological innovations and urges teachers to exert some influence on the quality of these materials so that students will not come to class filled with misinformation. (HOD)

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What Use Can Be Made of Technological Innovations in English Classes?

by

Alfred H. Grommon

I suppose we have no way of now finding out what anxieties or elation medieval scholars experienced when word reached them about Gutenberg. What threats movable type posed to scholars who knew only a world encompassed in hand-reproduced and illuminated manuscripts we can only imagine. Yet in 1966, we may be able to guess. Five hundred years later, we find writers, artists, teachers--and publishers--experiencing anxieties, if not horrors, at being faced now with irreversible changes, especially those invading their very lives as well as their livelihood.

Howard Taubman of the New York Times discussed this concern in his report of the P.E.N. Congress held in New York City this June. One panel talked about "The Writer in the Electronic Age." Just to strike terror to your being, I'll mention that Marshall McLuhan served as chairman. Taubman states that:

Most writers, composers, and painters know that the new machines are proliferating, becoming miraculously sophisticated and being entrusted with a vast variety of complicated, not to say awesome, tasks. But many are suspicious of the uses to which the new electronic marvels have been put. They fear that an almost universally mechanized, automatic society means death to the things they value.¹

¹ New York Times, June 14, 1966.

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I imagine we can add teachers, especially teachers of English, to those rendered nervous by these developments and by prospects of undreamed ones now on someone's drafting board in a corner of his garage or cellar. Yet the question in the title suggested for this brief paper implies that such devices are already being used in English classes and have some proper business being there. What can these uses be? Are we considering friends or foes? Is the fearsome 1984 already here?

Well, in a sense, yes. The gadgets are here-apparently to stay, but in ever evolving forms. They are already being used by teachers of English, especially in elementary and secondary schools, but also in colleges, libraries, and even in the studies of scholars and critics. In fact, at least one institution, Oakland Community College, Bloomfield Hills, Michigan, teaches its 4,000 students largely by means of electronic devices, films, and materials created by the faculty: courses, drills, and exercises to be dispensed through the apparatus, on call. And now that IBM, RCA, Xerox, and other producers of hardware and communications systems are combining with established publishers who will create the "software"-that apparently is the term now-we bookish people, old style, probably can't even speculate about the forms future products engineered by these combinations may take.

But your question and mine is this: What effect will all these mysterious developments have upon us ordinary teachers who like our classrooms, our books, our students, and the old give-and-take of

talk and discussion? How does one talk back to a machine? Well, we can, but more about that later. Let me try to reassure ourselves on this question. Designers and the most enthusiastic users announce that, whatever may be the wonders of these sophisticated masters or minions, they have never been intended to supplant the teacher. Instead, they are available to supplement, to enrich what the teacher wishes to achieve with his students, to open to him prospects of new forms of instruction and materials, and at the same time to relieve him of some of his more routine chores, even of the grading of written compositions, maybe. But one of the important realms denied the computer is that of man's creativeness. For creativity is yet one of the great mysteries.

I would like to review what some of these technological aids are and how they are being used by English instructors to help them teach the various aspects of English as a school and college subject. I am assuming that you are already familiar with much of this equipment and many of its uses, so this discussion is brief. Probably the most commonly used equipment is that for recording and playing back various kinds of tape, discs, and recordings. Teachers use these aids in their teaching of the English language: records and tapes of professionals reading selections written in Old, Middle, Elizabethan English; recordings such as Professor Helge Kjekeritz's treatment of 1,000 years of English pronunciations; tapes such as A Word in Your Ear, an informative, illuminating, and entertaining discussion and dramatization of the functions of language.

This equipment is also used to record students' speech so that they may hear themselves and also detect any "before and after" effects of training and practice. It is widely used in classes for disadvantaged students whose social class dialects may handicap them educationally, socially, and vocationally. By means of tape recorders, these students practice pattern drills to help them acquire some control of informal standard English by their overcoming some of the specific kinds of difficulties Professor Walter Loban has discovered during his long-term research into the language learning of his sampling of students, many of whom are Negroes. This equipment is indispensable, of course, in such investigations into language as those being conducted by Loban, Strickland, McDavid, Cassidy, and others.

It is also used by teachers who wish to record their reactions to students' compositions. These teachers and their students believe recorded comments are more personal, constructive, and of longer value than those written on compositions.

Recordings and tapes of dramatizations of Greek, Shakespearean, and modern plays, of the readings of poems, including those done by the poets, and prose passages, all of these enable the teacher to extend his students' experiences with literature. The use of contrasting interpretations of the same scene in a play leads to illuminating discussions of the nature of these different dramatizations, the rationale for the contrasts, and of what meanings can be read into or extracted from the same lines. All of these uses of recording equipment can also help students improve their skills in listening comprehension.

Films and film strips are also widely used, of course. No doubt you are already familiar with such excellent films as those on Greek, Shakespearean, and modern plays, on the times of Shakespeare and the background of the Jazz Age of the 1920's, and with the Humanities Series prepared by the Massachusetts Council for the Humanities, Inc., for the teaching of Oedipus the King, Macbeth, and Our Town. But some relatively recent films are especially timely. The National Council of Teachers of English and its Task Force have produced a valuable report on Language Programs for the Disadvantaged. The suggestions, illustrations, and recommendations should help teachers and districts improve programs considerably. Some new films, however, might also help teachers within the inner cities, but more so those outside and those preparing to teach, to gain insight into what being disadvantaged means to a child: these would be such new documentaries as Portrait of a Disadvantaged Child: Tommy Knight; Portrait of the Inner City; and Portrait of the Inner City School: A Place to Learn, all produced by McGraw-Hill Text-Films. Another new McGraw-Hill series should help teachers learn about, and how to teach, transformational grammar. These films and the many useful film strips on writing, language, composition, and the reading and analysis of literature constitute convenient help to the teacher who wishes to supplement and extend his teaching.

But unquestionably the most complicated yet most promising of the electronic devices developed so far is the computer. According to Dr. Richard Bright, Director of Research for the U. S. Office of

Education, computers for the classroom will be available by 1969. He predicts that within ten years they will be used in 5 to 25 percent of the schools. Soon after, they will be used everywhere. He says that computers will not take the teacher's place but will certainly change his role: "The question I'd like to see asked more often is not 'What will happen to teachers?' It is, 'Will the children receive a better education?' "2

He believes that computers can help teachers and students in at least four ways: (1) A student studying, say, phonemes in English grammar or reading skills can work at his own pace on lessons prepared by expert teachers and presented through computers. (2) They will be useful in small schools of limited enrollment and faculty. In addition to making expertly prepared lessons available, they will also create flexible scheduling so that teachers' talents and time are used more effectively and more students will be able to study independently. (3) Computers will spare teachers such routine tasks as filling out report cards, recording attendance and registering students. (4) Computers and educational television will enable students to benefit from some of the most effective teachers in the country, no matter what the caliber of teachers in their own schools.

An increasing number of schools are now using computers to schedule classes and students. Many have flexible schedules constructed in units or modules of 15 or 20 minutes each. The staff and faculty decide how much time each day should be devoted to each subject and also how

² Jerrold K. Footlick, "How Computers Will Change the Teacher's Role," The National Observer, May 9, 1966.

much time each student, on the bases of his background, ability, interest, educational and vocational goals, should spend on each subject. English is one of the subjects that receive major blocks of time. Provisions are made for at least four types of teaching: small group, laboratory, large group, and independent and individual study.³ The English teachers in such a school can easily assemble a number of classes, for example, to see a film, a dramatization, or hear a lecture. Students then can be organized into small groups for discussion, in-class writing, or supervised study. Finally, students are provided with time to study independently. In some schools that have flexible schedules, about 30 percent of a student's time is programed for independent study. According to reports from these schools, discipline problems have decreased, the use of the libraries has increased, and new possibilities in the organization and presentation of courses have been opened for teachers of English.

Computers are already being used to assist in the teaching of reading, spelling, logic, and arithmetic. Such programs have been prepared and used in elementary schools by the Stanford University Institute for Mathematical Studies in the Social Sciences. This fall, these and other carefully designed and tested programs will be sent into a new elementary school built expressly for this purpose, where 170

³ Robert N. Bush and Dwight W. Allen, A New Design for High School Education (New York: McGraw-Hill Book Company, 1964), pp. 8, 186.

first grade children and their teachers will work at sixteen terminals in the school and study computer assisted programs for at least an hour each day. About 80 percent of these children are Negroes, many of whom apparently have little incentive to learn. One aspect of this program which will be especially watched is the social impact. As Professor Patrick Suppes of the Institute says, the computer never "expresses scorn or impatience." It may thus help these youngsters develop a genuine desire to learn.

All of these lessons must be prepared with extreme care. Here the experienced teachers are indispensable. They work with psychologists, linguists, reading experts, and advanced graduate students developing and testing material "within the framework of a set of theoretical propositions based on recent developments in psycholinguistics and learning theory."⁴ Such a group in the Stanford program has now written over 200 lessons in reading, coordinating all the elements: written lessons, film strips of illustrations, audio instructions, and recorded answers to all kinds of anticipated questions. The child's responses can be registered in three different ways. Here a dialogue with the machine may soon be possible. These responses are recorded, scored, and related to his past history and performance, which have been previously stored, so that the teacher, the school, and the parent have available at any time a complete record of the child's development which can be pulled in from storage instantaneously. At present,

⁴ Richard C. Atkinson and Duncan N. Hansen, "Computer-Assisted Instruction in Initial Reading," Institute for Mathematical Studies in the Social Sciences, Stanford University (Portions of an unpublished paper presented at the American Educational Research Association Symposium, Feb., 1966).

these projects are located at universities and other centers because of costs and the need of highly trained people in research and in creating the fantastically detailed programs fed to computers. These lessons are now sent into the schools via telephone lines. But as Dr. Bright predicts, computers will soon be available that can be installed in classrooms.

Another way in which computers may help teachers of English is through what is called "computer-controlled information and retrieval systems." Some of the possibilities and complications of these systems were pointed out by James Cass in his editorial "Education and the Copyright Law" in the Saturday Review, May 21, 1966, p. 54:

Entire libraries can be fed into such systems, to be stored on magnetic tape or microfilm. Then, upon demand (in some systems by simply dialing a code number very much as a telephone is dialed), any work or any portion of a work can be printed automatically, or projected on a screen. All of the schools in a community can be linked to such an information storage center-or all the schools in a state or a region. Manifestly, one book fed into an information center of this kind may take the place of a dozen or a hundred books in traditional libraries serving a like area. Such information storage and retrieval systems are not yet in general use, but the technology for them exists and pilot installations are being tested. Almost certainly they will become common in the near future.

In such a system, the resources of the English teacher, his classroom, and students are extended astonishingly, limited only by the resources of the information center. And in that kind of world, the teacher will never have to worry whether a crucial book may be out and in use by another borrower, or lost. I suppose that in such a world of books, we may truly need "Neither a borrower nor a lender be."

These possibilities of calling up a book by dialing a number and of duplicating large chunks of printed materials by means of photocopying devices already being widely used frighten authors, publishers, artists, and booksellers. These are some of the problems the House Judiciary Committee is struggling with in trying to write a copyright law that will sufficiently protect the rights of authors, artists, publishers, and others without unduly restricting the "fair use," yet to be defined, made by teachers, especially teachers of English.

Computers are also being used by literary scholars. Perhaps you are familiar with the use of computers made by S. P. Rosenbaum in preparing A Concordance of the Poems of Emily Dickinson.⁵ In his preface he explains some of the many advantages computers afforded him in the treatment of words, particularly of small, common words usually deleted from concordances. But in this case, some of these words are important to Emily Dickinson's imagery, her use of the subjunctive, and her use of pronouns, which become especially relevant to biographical studies. In addition, of course, the computers saved the investigators an enormous amount of time.

You may be horrified or relieved to know that computers are also being used to evaluate students' written compositions. Professor Arthur Daigon of the University of Connecticut tells about this development in his article, "Computer Grading of English Compositions."⁶

⁵ (Ithaca, New York: Cornell University Press, 1964).

⁶ English Journal, January, 1966, pp. 46-52.

He says that some experimental programs at the University of Wisconsin, the Systems Development Corporation, and Project Essay Grade, supported, interestingly enough, by the College Entrance Examination Board, indicate that enough specific components of grammar, "available lexical and punctuation clues," organization of materials-whatever it is that the instructor selects as being relevant to what he wants to look for in a particular set of compositions-can be stored in the computer to enable it to record these elements in a student's paper. He points out that those engaged in this research are only beginning to explore the possibilities.

I mentioned earlier that Oakland Community College in Bloomfield Hills, Michigan, is an institution that uses all sorts of technological aids and courses written by the faculty to offer its 4,000 students programed materials that each student can call up to study at his own pace. Tutors are nearby to help when needed. But this number is relatively insignificant when compared to those taking courses via educational television. I have no current figures, but in 1963, only ten years after the start of educational television, there were seventy five stations, and "more than 2.4 million students (including those in college) were enrolled...in TV courses for credit. Almost 30,000 courses, according to Michigan State University, (were) being taken for credit on closed-circuit and commercial T.V."⁷

⁷ Terry Ferrer, Classroom Revolution (New York Herald Tribune, 1963)

As bewildering and perhaps alarming as the present and future prospects in this array of developments may be, the "live" teacher is in no danger of being displaced. Instead, the sooner we explore the possibilities of introducing relevant processes and materials into our teaching, to help with what Bruner calls expository teaching and drills and routines, the sooner we are likely to free ourselves to devote energy and time to the kind of teaching machines and computers are not planned to do, indeed are incapable of doing. In this kind of teaching, the hypothetical mode, we can lead our students into a consideration of what is possible, the "why" aspect of man, lead them to the distinction between convergent and divergent thinking, to a discussion of the nuances of oral and written expression and literature, to explore the openended questions and ambiguities in literature, to discover for themselves, to speak more effectively, to communicate with people.

These technological innovations cannot create. The most resourceful of them will be no better than the quality of the programs created for them by teachers to transmit a wealth of ideas, procedures, information, and skills to thousands of other students and teachers, rather than to just the fortunate few who happen to be studying with the expert teacher.

During our lifetime, we have already seen far greater, undreamed of developments in electronic aids to learning and teaching than emerged in the 500 years between Gutenberg and now. I think the best answer I have seen to the question of the place of the artist, the

teacher, in this kind of future, already here, is another question asked by Eugene Leonard of the Digitronics Corporation, designers and developers of computers and data processing systems. When asked about the future role of the artist, he replied, "Is there a future for a computerized world without artists?"⁸

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Howard Taubman, op. cit.

Plenary Session - Study Group 7 - 9/8/66

Susan Meyer Markle, Discussant

MISS MARKLE: When Jim asked me to come up here, I investigated the plane schedules and decided it was impossible to get up to this place from Chicago. So I sent him a wire saying I would advise that we have a telephone conference; that since I was going to discuss the new media, wouldn't it be appropriate if we used one of the new media which relieve people like ourselves of spending a full day at airports. Jim sent back a wire saying that it was not appropriate to the purposes of this conference that we employ new media (Laughter). So I left behind all sorts of examples of the new media that I might have brought, and I am quite glad I did, because the television tape weighs 20 to 30 pounds, and I can see there would be no opportunity here for impressing you with programmed television.

I am a firm disbeliever in one person sitting in front of the group and talking. We found this to be pretty ineffectual in structural procedure so far; but I'll make a few comments and then I would like to have people bring issues up for debate.

I would like to respond to this study paper on technological innovations by making one comment and that is that what I consider to be the real technological innovation has been kind of overlooked. Yes, we have gadgets, yes, we have devices, there is a great deal going on in that area and I feel that Dr. Loban did a beautiful job of covering what going on with this aspect of technology. I take technology to mean

the application of scientific principles to some tasks that need doing, and the science that has been abhorred here is psychology. While that may be a dirty word around here, I would like to put in a few basic principles, simple little ideas, of the types of things people who call themselves programmers work on. It occurred to me that to present a basic philosophical position I should either get extremely pompous or I would have to resort to humor, in talking to an intelligent group like this, so I have chosen to resort to humor by reading a few passages from one of the best papers that has ever been published in the field, that appears in a little booklet called The Compleat Programmer, edited by me, which includes the devil's dictionary, programming instructions and very exemplary programs.

This little paper is called, "Are Automated Universities Passé," and it is an interview in the year 2065 between the chairman of one of these automated universities and a gentleman named Mr. Yak, who has a novel idea, the introduction of live teachers into the university. The chairman says, now let me ask you a few questions. As you know, we run a standard university, Model U-238. This gives us a 500-course curriculum in depth 5 and we can take a peek at 20,000 students. Our dormitory rooms are all equipped with SS-17 student stations and accompanying reference libraries. Naturally, the computer is interconnected with all other universities and updates its curriculum continuously through the automatic curriculum interchange through our subscription with ITI, the Institute of Tested Instruction and through contributions

by students. Tell me, if I brought one of these live teachers into this picture, where would it work. The student stations are designed for one student, it would be a little cramped.

So we introduce now the notion of classrooms. "You mean to tell me that a single live teacher can teach 100 students at a time?"

Yak says certainly; a tremendous idea, isn't it?

But I am not sure I understand. We don't have 100 students who are all alike. The largest seminar of equivalence our computer has ever been able to organize had only 6 students.

Well, sir, they don't have to be alike, they can be as different as you imagine _____ (152) advantage of the system. Tell me what the teacher does that makes this all possible.

"He talks to them--" This is exactly my feeling up here. "He talks to them. The technical term is 'lecture'."

"To all of them at the same time?"

"Yes, sir; to as many as may be. Beautiful idea, isn't it?"

"He says the same things to all the students, even though they are different?"

"Yes, indeed; they all get the same message at the same time."

"He repeats himself to each group of students?"

"Yes, indeed."

"Why in the world would any intelligent human being want to spend his time doing that; behaving like a two-legged tape recorder, doing something the machine can do better. Surely their memory can't be as good as that of a computer."

"Of course not, sir."

"Then they make mistakes when talking to students?"

"Well, they're only human."

There is another rather clever idea that is in here. Then they get on to what lectures can do, and the chairman of the university asks, "May I ask what happens if some of the students don't understand what he is told?"

"Very simple, sir. The students go to their textbooks and study until they do understand."

"Hmmm. I can conceive of situations where that remedial expedient won't work. What would happen if the student still didn't understand?"

Mr. Yak says, "You fail them."

"I, what?"

"You fail them, yes sir."

"But my good man, we are not in the business of failing students, we are in the business of educating students. How long do you think we would last if it became known that we were taking money from students and then refuse to accept the responsibility to do everything in our power to educate them to their full potential."

There are more intriguing little notions in this paper, and I would like to leave it behind for anyone to look at.

The technology that I see coming in the future includes these kinds of ideas. There is an intriguing trend coming which certainly NCTE is involved in and so are other groups, that instruction is a responsibility

of all scholars, that there should be some agreement on curriculum, and that curriculum should be open and available to all people, so that you can get rid of the errors that do exist when we do have the human individual in front of the classroom with the limitations of one person.

The intriguing notion that Nabor suggests in this article that the only instruction that should get through to the student is that instruction which has been tested on and revised by student participation is one of the basic defining properties of what those of us in programming instruction think programming instruction is. The basic notion being that you work on a set of curriculum materials, and keep revising it, testing it out on students and revising it until it does work. This, of course is not true of many of the so-called programs that are available in education. There was a little finding six months ago in a bibliography of all programs available to schools and colleges at the moment, that 40% of the material which is called program material by publishers has never even seen one student, much less revised until they do bring all students up to a certain level.

One of the basic notions that Mager makes quite clear is that instruction proceeds at the individual's pace according to the individual's talents and perhaps interests as well. We are beginning to see some of that in some of the research that is going on, not only that students can take as much time as they want, but that the actual sequencing of instructional materials and even in one (coughing) the tone of presentation is adjusted to the student's personality.

The basic idea, I think, that is coming into prominence from the programming movement is the idea that instruction is to change student behavior; in other words, that the performance of the student is the important thing. Throughout Mr. Grommon's article I see the suggestion that there are little bits and pieces of instructional materials that can be put together by the teacher; he makes a very strong point and I suppose it is a point which you all happily agree with, that none of the work that is going on at the moment is going to supplant teachers, that it is simply assistance for the teacher. He asks a delightful question of what effects the student technological media are going to have on we ordinary teachers. I might suggest that this group and most others concerned with instruction are not ordinary teachers, but if you want to see an ordinary teacher go out in the classroom at random and see what really goes on.

One of the lines I could take is to present to you some of the things that are going on in the broader area of the application of programming instruction. I like to define programming as a process which involves this closed loop system of introducing students into the design materials, of being extremely clear, almost to the point of picayune-ness, of where you are going. I heard from Jim Squire yesterday that one of the questions we haven't completely answered yet is "What is English?" and unfortunately, programming as a process forces the instructor to define exactly what it is he is trying to do. Otherwise, you can't improve it until you know where you want to go, how you are going to measure it, and what you are doing now; there is no way of improving the instructional process to the point

where the instruction given to a student is in a sense guaranteed to raise him to a certain level.

I would suggest that in the near future, teaching is going to be considerably different from what it is now, in the sense that more and more of the decisions are going to be decisions based on valid experimental evidence and decisions that the teacher in a sense can inviolate without destroying the effectiveness of the materials. And there is at least one program out at the moment in beginning reading which has some pretty nice data on it. I am not sure where it has failed. Publishers are very bad, of course, about telling you the conditions under which a program fails. They are quite good in informing you of its successes and I am aware only of the successes of this particular program. In this program the teacher herself--this is for beginning reading, so I presume it's a her-- the teacher herself is programmed; in other words, she must do certain things in a certain order, according to the program that is laid out by the designer of the total system. If she does not, the data show, the program simply doesn't lead the students to read very well. If she follows this procedure, students in the second grade have been found to be reading at the fifth grade level when they finally got through these little books. The involvement of the teacher, in other words, as a cog in the wheel, seems to be a wave of the future in many project. Many of you are aware of Omar Khayyam Moore's work with three-year-olds. We have all heard about the talking typewriter, but how many people are aware that the total system he is working with involves highly trained people; teachers, tutors, if you like. They work with students on an individual, one-to-one basis,

when the student is not working with the talking typewriter. Omar Moore, incidentally, has a grant from the Office of Economic Opportunity. His project is merely one of the projects that we see coming up at present which are by-passing the school system. They are not going through the school system. Omar has a flying squad, you might call it, of trained tutors. He's got one flying squad that went right into the area in Chicago that blew up last year. They are not only teaching pre-schoolers how to read but they are teaching school drop-outs how to teach pre-schoolers how to read. So they are going around the school system at both ends in the particularly bad areas. He has a similar flying squad that is hitting an area in Colorado where we have a great many migrant workers and their young offspring who also are more or less outside the school system, and he's got another team down in Puerto Rico. These three projects, of course, will set up an instructional system which is in no way connected with the school, which is putting into operation the type of techniques that he has been researching for many years.

I presume most of you have seen the new statement of McNamara that the Army is going to take over the education of some of the people whom the school systems have failed to educate. We will be watching this with considerable interest. One of the biggest programming outfits is the United States Air Force. Most of their instruction has gone through this validation process. The Air Force is quite famous for one of the key notions in programmed instruction, in what's known as the 90/90 criteria, that 90% of the students will get 90% or better on the criterion tests or else

the instructional materials go back to the designer for further research. And for a couple of years they held to this principle. They now are getting to the point where they recognize that this is an arbitrary standard, and they are changing the standard according to the conditions. But given a group of students whom they intend to teach, and, of course, if one of the students is a little too dumb for this course they put him on latrine duty or something and don't have to teach him radar repair work.

Given a selective population, however, they have quite recently kept their programmers at work until their programs reached this sort of level. Like many others of us, they are working with all media; in other words, the process of determining exactly where it is you want to go, of finding out essentially what your students are like, and of working on instructions until, given this group of students, they do at the end of the instruction what you want them to do. This process can be applied to any medium, any of the devices that Dr. Grommon discusses, including computing.

We are working at the Offices of Instructional Resources with freshman composition and program instruction. This generally arouses considerable heat among English professors because they feel that you can't possibly program composition.

I should point out that, along with programs in the sense that most of you know, namely, the paper and pencil active response type of material, we have a Professor of English who is working on televised lectures. He has his first draft, you might say, of the lectures of the course. In

other words, we now have a canned -- eighteen cans, as a matter of fact, of teacher behavior -- this is one way of looking at it (Laughter). We take each of these cans of teacher behavior, which now are reproducible. In other words, we can try different things with students. We can give them lead-in materials and see whether this makes the lecture comprehensible. We can give them materials to work on with the lecture. We can break these tapes into different sizes, for instance, and have them do some activities in what were ordinarily within our lock-step university system an hour lecture; we can break it into two parts and have them do something in the middle.

We can also observe students, ask questions and find out where the lecturer is going over their heads. I have some clues -- professors at universities sometimes go over my head -- and these are spots that I choose to watch because I predict that if he goes over my head, he may be over (other) heads, too.

Built into the system is not only this large group of performers, the lectures, the canned behavior and the self-instructional laboratory which we are developing, but also something which will warm all your little hearts, and that is that each student has a tutor. He meets with his tutor in a group of approximately five students, some of them are as large as six, once a week and has his compositions analyzed in front of his class. In other words, what we are doing is building a total system, with a place in it for the tutor as a person, and one of the things we hope to find out, of course, is how much of the training in composition -- I

am sorry to use that word, but training is sometimes a good word -- how much of this has to be done by the individual human instructor and how much of it can be put into the type of medium which is not flesh and blood, although its origin, of course, is the human instructor, who is on video tape, who behaved in front of a camera, or who behaved in front of a typewriter and made little scribbles on paper.

About three weeks ago, I was in New York at a conference sponsored by the American Management Association. There is an awful lot of money floating around, as you all know -- a great deal of it is going into education in the near future -- this has been said so many times that it seems hardly worth repeating. I spent a lot of time there talking to people in the education industry, telling them that they had better get themselves a bunch of professors or otherwise they are going to do some damage to scholarship. I feel as if I ought to get over on the other side now and tell professors they had dawgone well better get into this education industry and have a say in where they are going, or else the materials which come out of these groups are going to be materials you can't stand; on the other hand, they are going to be materials that are used. One of the big industrial concerns tells me that they are not even going to bother to peddal their materials to the schools because this takes too long, but go through the school board. What they intend to do is door-to-door selling, and if they get parents to buy these instructional materials for their kids, and the parents start putting pressures on the schools, before you know it, the schools feel that they have to have brand X or they are going to hear it from a bunch of PTA'ers. The American industry has not been shy at all about

creating demand (Laughter). I would suggest that if they choose to sell a noun is the name of a person, place or thing in editions of a million copies per, they can do this quite easily. I am not quite sure how this type of arrangement should go; in other words, I have no suggestions. I just pose the question of how a group of scholars like yourselves, who are concerned with curriculum and objectives can exert some influence on what is going to be a wave of products. I myself am highly involved in trying to push these people towards the notion of quality control of what they bring out, and by quality control I mean that which the psychologist programmer in particular is interested in, namely that it is effective and reasonably efficient. It is possible, of course, to get a very effective and efficient set of materials that teach students misinformation. I think that is your primary responsibility, to exert some influence on the groups, but to be sure that the directions they choose to go on don't produce a group of students coming into your classes who are so full of misinformation that you can have no effect in the time which you have to deal with them.

I would like to throw open the session for any questions I can answer.